

REMARKS/ARGUMENTS

Claims 1 has been amended to recite at least one mineral acid in the cleaning solution as recited in original claim 7 and to recite a separate cleaning step. Claim 7 has been cancelled. Claims 13 and 17 also recite a separate cleaning step.

The present invention relates to cleaning of metals, which contrary to etching does not involve dissolution of substantial amounts of metal. It has surprisingly been found that if the cleaning solution comprises hydrogen peroxide, a mineral acid and at least one compound selected from the group consisting of complexing agents based on phosphonic acids, salts and degradation products thereof in an amount from about 10 to about 60 wt% the metal is efficiently cleaned and also become passivated and protected against further oxidation.

The Examiner has rejected the claims based on one or more of US 4,378,270 (Brasch), US 6,599,370 (Skee), US 4,001,509 (Schellinger), US 5,885,362 (Morinaga et al) and US 4,070,442 (Watts).

Brasch relates to a method of etching. The disclosure is directed to recovery of copper by a method comprising adding an organo phosphonic acid to the spent etching solution and electrodepositing the copper from the solution in the form of solid pure copper metal. There is no hint that the etching solution could be used for cleaning.

Skee relates to an alkaline composition for stripping or cleaning integrated circuit substrates. The composition should have a pH in the range of 10-13 and cannot for this reason comprise any mineral acid.

Schellinger relates to a composition for etching comprising hydrogen peroxide and an aminomethylene phosphonic acid. There is no hint that the composition could be used for cleaning of metals.

Morinaga et al relates to a method for treating the surface of a substrate with an alkaline composition comprising an oxidizing agent and a complexing agent. As the composition is alkaline it cannot comprise any mineral acid and the complexing agent is present in an amount of only 0.1 wt%.

Watts relates to a stabilized hydrogen peroxide composition. However, there is no disclosure to use this composition for cleaning of metals.

The Examiner has rejected claims 1-2, 4, 8 and 12 under 35 U.S.C. § 102(b) as anticipated by Brasch. However, as shown above Brasch does not disclose cleaning of metals and cannot for this reason anticipate any of the claims in the present application.

Claims 1 and 8-12 have been rejected under 35 U.S.C. § 102(e) as anticipated by Skee. However, Skee does not disclose using a solution comprising a mineral acid. In contrast the composition used in Skee is highly alkaline.

With respect to the rejections under 35 U.S.C. § 103, similar arguments apply. Brasch teaches etching, as noted above, and thus necessarily requires dissolving considerable amounts of metal, while the present invention relates to cleaning. One skilled in the art would not contemplate using an etching solution for cleaning of metals as he would then expect the metal to be damaged. Therefore, the invention as defined in the present claims cannot be obvious over Brasch alone.

Furthermore, Schellinger related to etching. Thus, the combined disclosure of Brasch and Schellinger teaches that a certain composition would be useful for etching. As noted above, a skilled artisan would never contemplate using such a composition for cleaning metals. Therefore, the combination of Brasch and Schellinger does not render the invention obvious.

The Examiner has rejected claim 15 under 35 U.S.C. § 103 as obvious over Skee in view of Morinaga et al.

However, both Skee and Morinaga et al relate to the use of alkaline compositions, which cannot contain any mineral acid. Considering that both Skee and Morinaga teach that it is essential that the compositions are alkaline, a person skilled in the art would never contemplate including a mineral acid. Therefore, the invention as defined in the present claims cannot be obvious over Skee or Morinaga et al, either taken alone or in combination.

Claim 16 is rejected under 35 U.S.C. § 103 as obvious over Morinaga et al in view of Watts.

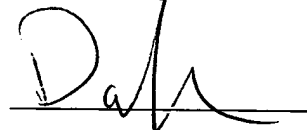
However, as already pointed out, Morinaga teaches that alkaline compositions are necessary for cleaning and since Watts does not indicate that any hydrogen peroxide solution would be useful for cleaning it cannot be obvious to a person skilled in the art to

clean metals with a solution comprising hydrogen peroxide, a complexing agent based on phosphonic acids, salts and degradation products thereof and a mineral acid as claimed.

In view of the above, a Notice of Allowance as to claims 1-6 and 8-16 is requested.

Applicants petition for an Extension of Time of 3 months to respond to this Office Action. The Commissioner is authorized to charge the necessary fees, and credit any overpayments, to Deposit Account No. 501348.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. Serbin', written over a horizontal line.

David J. Serbin

Reg. No. 30,589

White, Redway & Brown, LLP
1217 King St.
Alexandria, VA 22314
Tel. 703-299-0035
Fax 703-299-0036
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